



2024 NEBRASKA MOSQUITO-BORNE DISEASE REPORT

NEBRASKA DEPARTMENT OF HEALTH
AND HUMAN SERVICES (NDHHS)

VECTOR-BORNE DISEASE PROGRAM

MMWR WEEK 28

(Week Ending 07/13/2024)

****All Data is Provisional****

Report Highlights

- Mosquito-Borne Disease Cases
 - The first West Nile virus (WNV) human disease and viremic blood donor cases of the season have been reported.
 - No WNV associated deaths have been reported.
 - No WNV equine case have been reported.
 - No WNV bird cases have been reported.
- Mosquito Surveillance (6/30/2024 – 7/13/2024)
 - 161 *Culex* mosquito pools (containing 3,095 mosquitoes) were tested.
 - Seven mosquito pools (4.3%) tested positive for WNV from four vector surveillance regions (VSR).
 - WNV mosquito infection rate over the last two weeks is in the moderate category.
 - 479 *Culex* mosquito pools (containing 8,562 mosquitoes) have been tested in 2024.
 - There have been a total of 10 WNV positive pools (2.1%) in 2024.
 - No mosquito pools have tested positive for St. Louis Encephalitis (SLE) or Western Equine Encephalitis (WEE) viruses in 2024.
 - Four VSRs have reported ≥ 1 WNV positive pool in 2024.
- WNV Risk
 - Average statewide WNV risk is **MODERATE**
 - Southeast VSR WNV risk is **LOW**
 - Central, Metro, and West VSRs WNV risk is **MODERATE**
 - North VSR WNV risk is **HIGH**

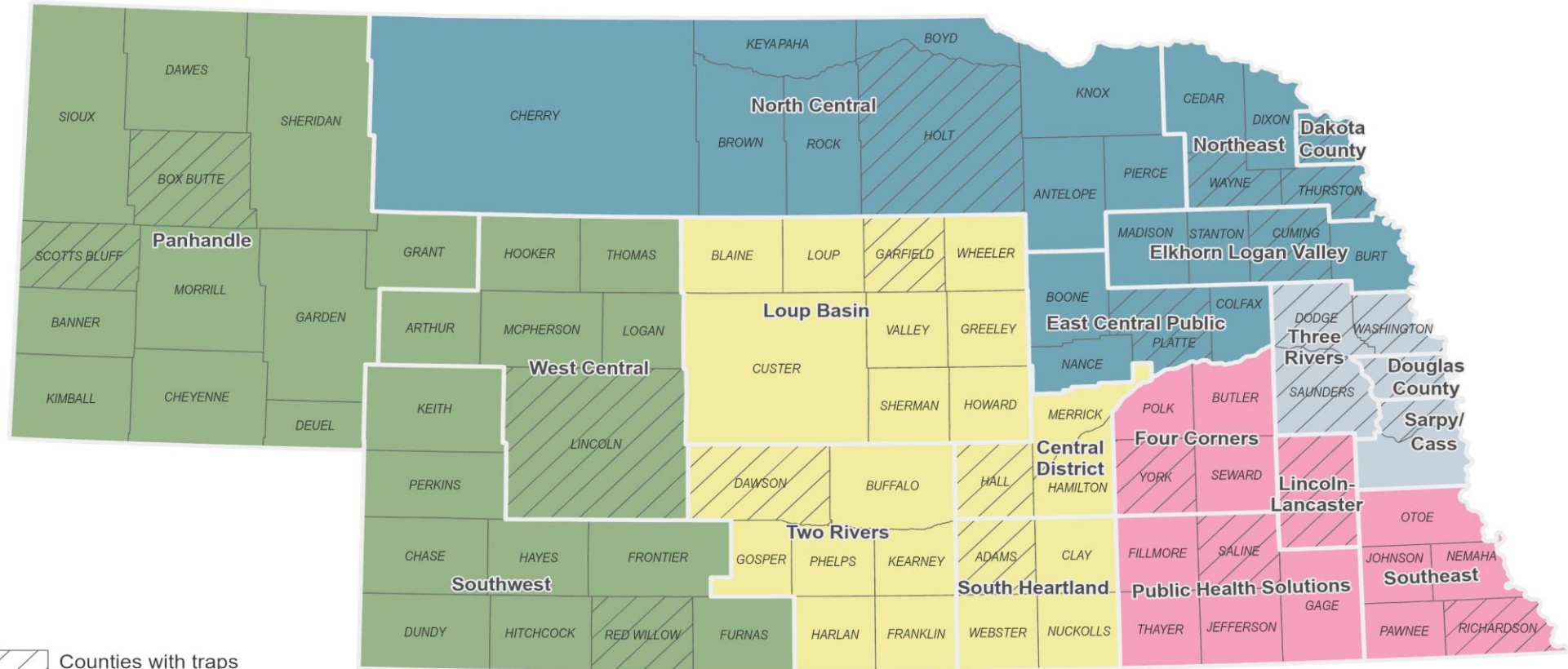
Credit: CDC NCEZID-DVBD

Remember LOW risk does not equal NO risk

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2024 Mosquito Surveillance Trapping Regions



-  Counties with traps
-  Counties without traps
-  Local Health Department Boundary
-  West Vector Surveillance Region
-  North Vector Surveillance Region
-  Central Vector Surveillance Region
-  Metro Vector Surveillance Region
-  Southeast Vector Surveillance Region





Credit: CDC, NCEZID-DVBD

NEBRASKA HUMAN MOSQUITO-BORNE DISEASE SURVEILLANCE

Human Mosquito-Borne Disease Surveillance

Nebraska Mosquito-Borne Disease Cases, 2024 & 2023

| Condition | 2024 | 2023 |
|--------------------------|------|------|
| Chikungunya** | * | 0 |
| Dengue** | 0 | * |
| Malaria** | 9 | 13 |
| West Nile Clinical Cases | * | 150 |
| West Nile Blood Donors | * | 42 |
| Zika** | 0 | 0 |

*Data suppressed due to low numbers (1 – 5 cases).

** Reported cases have all been acquired during overseas travel to endemic areas.

- 2024 statewide number of mosquito-borne disease cases reported to the Nebraska Department of Health and Human Services (NDHHS) through MMWR week #27 (week ending 7/13/2024).
 - All data is preliminary and subject to change as more information is gathered.
 - Reported cases only include confirmed and probable cases meeting CSTE/CDC case definition and approved by NDHHS.

Human West Nile Virus Disease Clinical Information

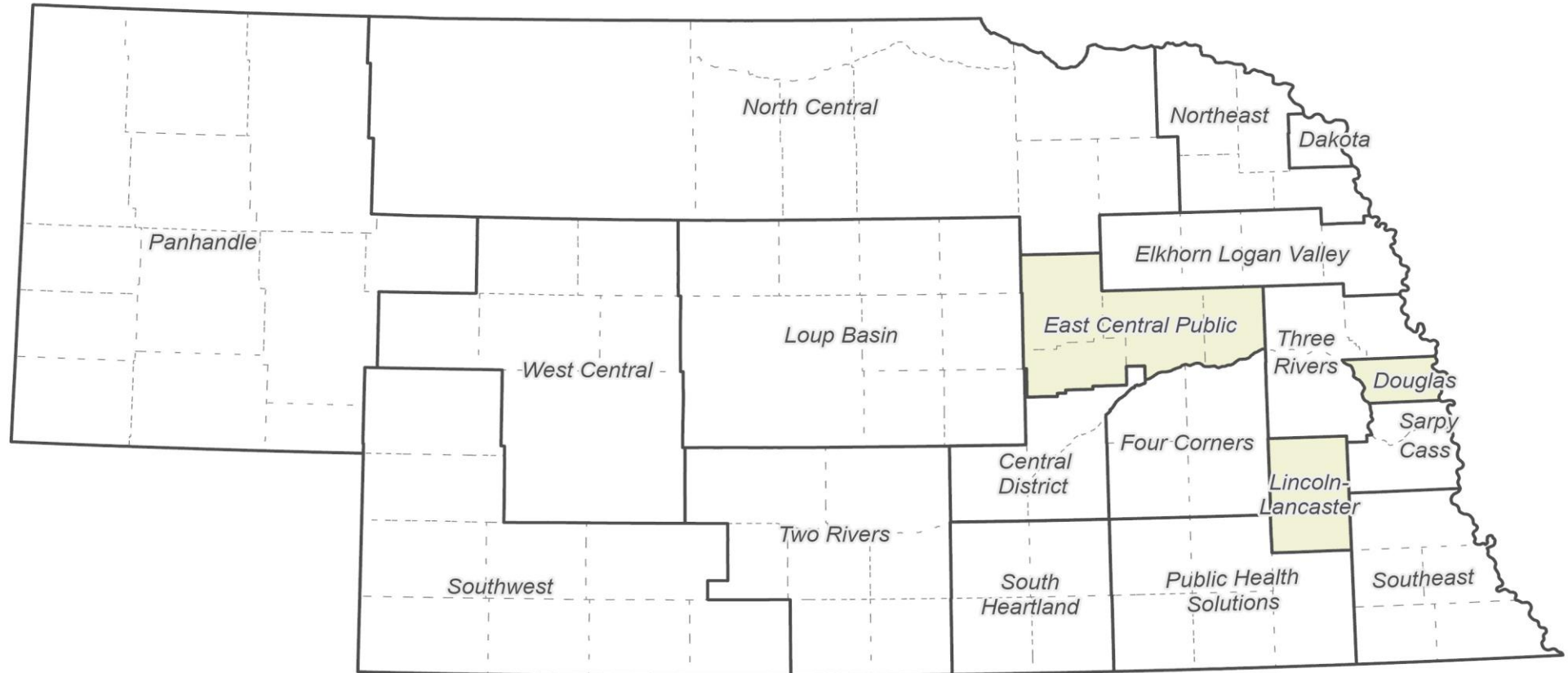
Nebraska West Nile Virus Disease Case Clinical Information, 2024

| Age Range | # |
|-----------------------|---|
| 0-13 | * |
| 14-25 | 0 |
| 26-50 | 0 |
| 51-64 | * |
| 65+ | * |
| Sex | # |
| Male | * |
| Female | * |
| Diagnosis | # |
| WNV Neuroinvasive | * |
| WNV Non-Neuroinvasive | * |
| Hospitalized | * |
| Deaths | 0 |

*Data suppressed due to low numbers (1 – 5 cases).

2024 West Nile Virus Human Clinical Cases

by Local Health Department, Updated 17 July 2024



Number of Human WNV Clinical Cases

0 Cases (16 LHD)

1 to 5 Cases (3 LHD)

County Boundary

Local Health Department Boundary



0 25 50 Miles

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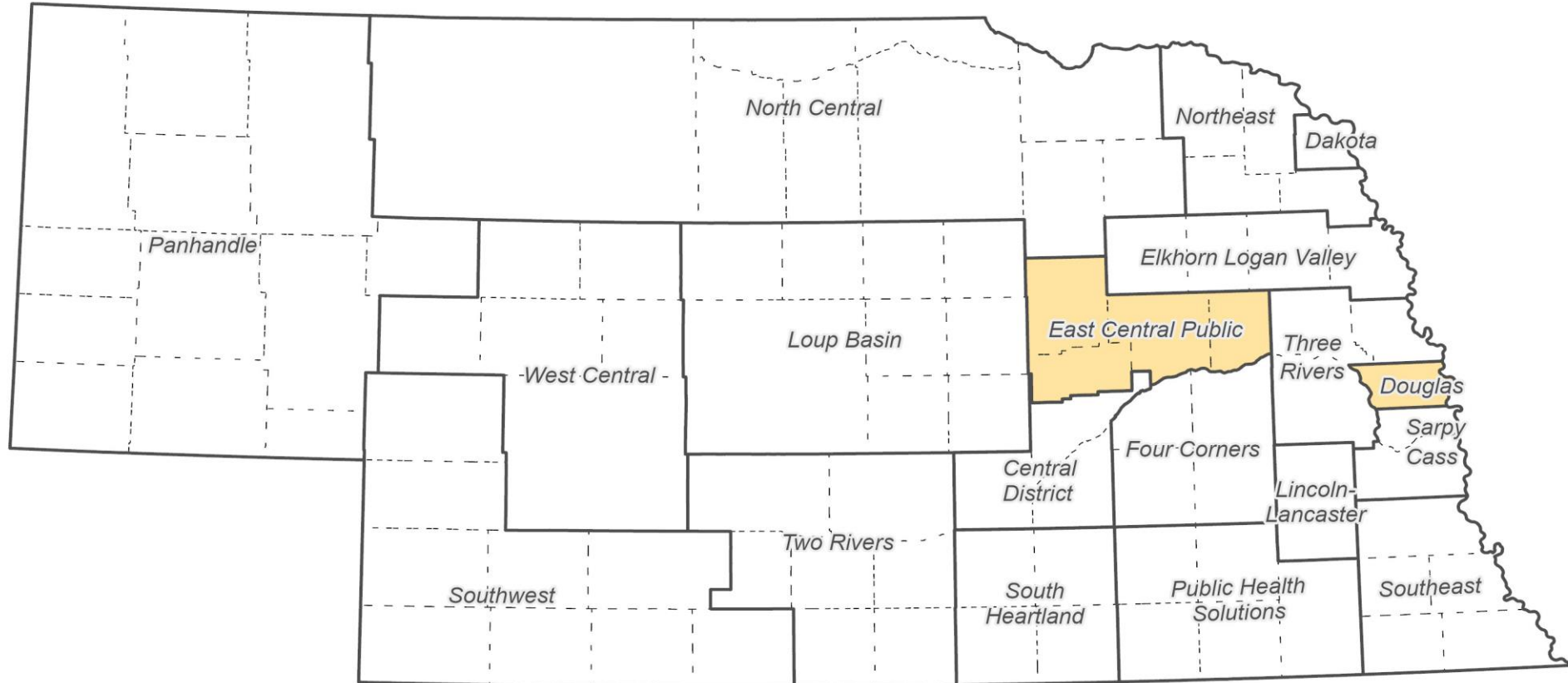
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2024 West Nile Virus Blood Donation Cases

by Local Health Department, Updated 17 July 2024



Number of Human WNV Blood Donor Cases

0 Cases (17 LHD)

1 to 5 Cases (2 LHD)

County Boundary

Local Health Department Boundary



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NEBRASKA MOSQUITO SURVEILLANCE AND PATHOGEN TESTING PROGRAM

Credit: Credit: CDC, NCEZID-DVBD

Mosquito Surveillance and Testing



- NDHHS uses mosquito surveillance and pathogen testing of mosquitoes to help determine WNV risk in the state.
 - Mosquitoes are collected from across the state through partnerships with the local public health departments.
 - Collected mosquito samples are sent to the NDHHS Medical Entomology Lab located at the Environmental Public Health Laboratory in Lincoln.
 - At the lab, mosquito samples are identified, counted, and *Culex* species mosquitoes (primary WNV vectors) are pooled for pathogen testing.
 - Pooled *Culex* mosquito samples are tested by the Nebraska Public Health Laboratory (NPHL) for 3 viruses
 - West Nile Virus (WNV)
 - St. Louis Encephalitis Virus (SLE)
 - Western Equine Encephalitis Virus (WEE)

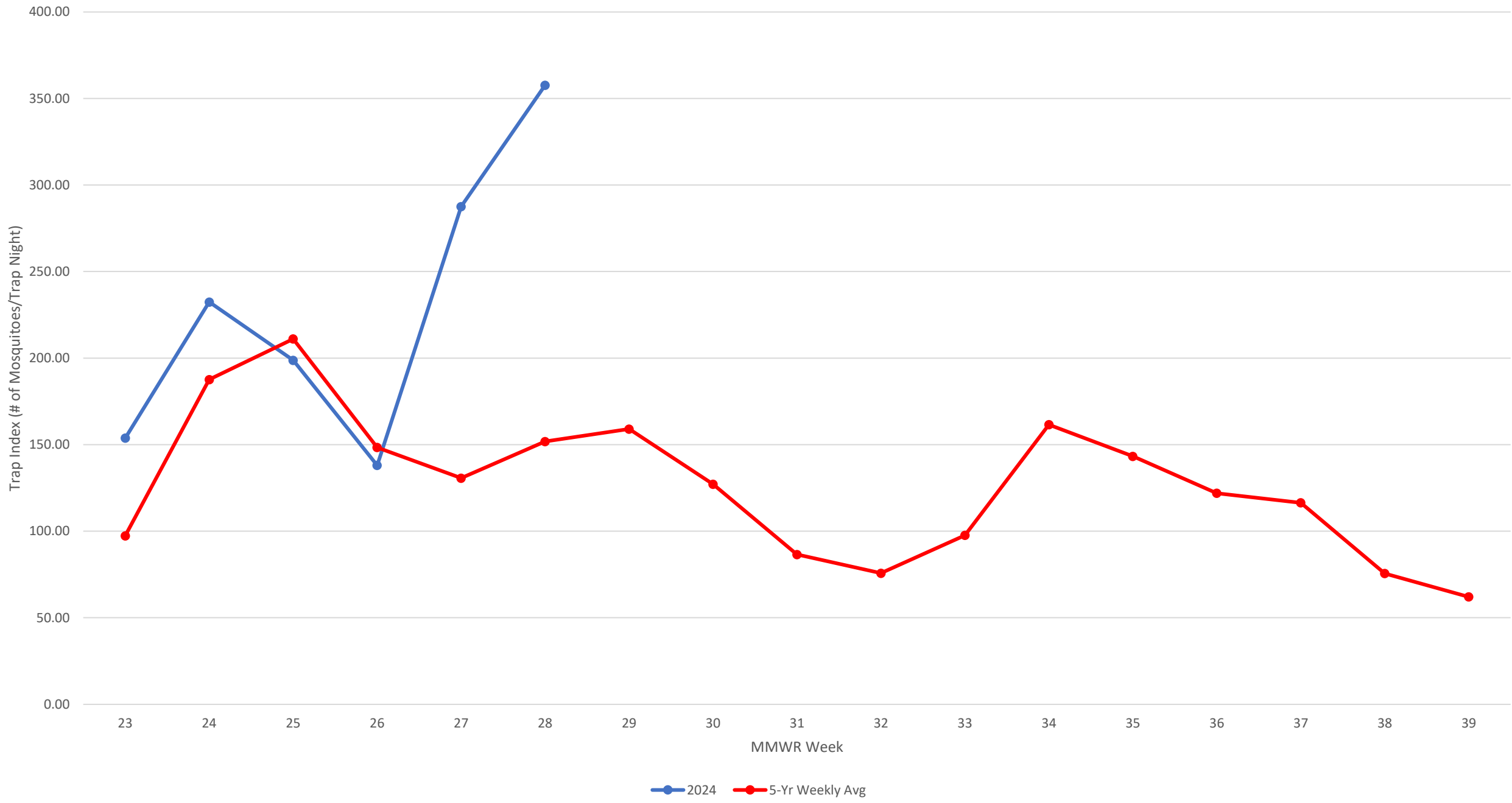


2024 Statewide Mosquito Surveillance and Testing Summary

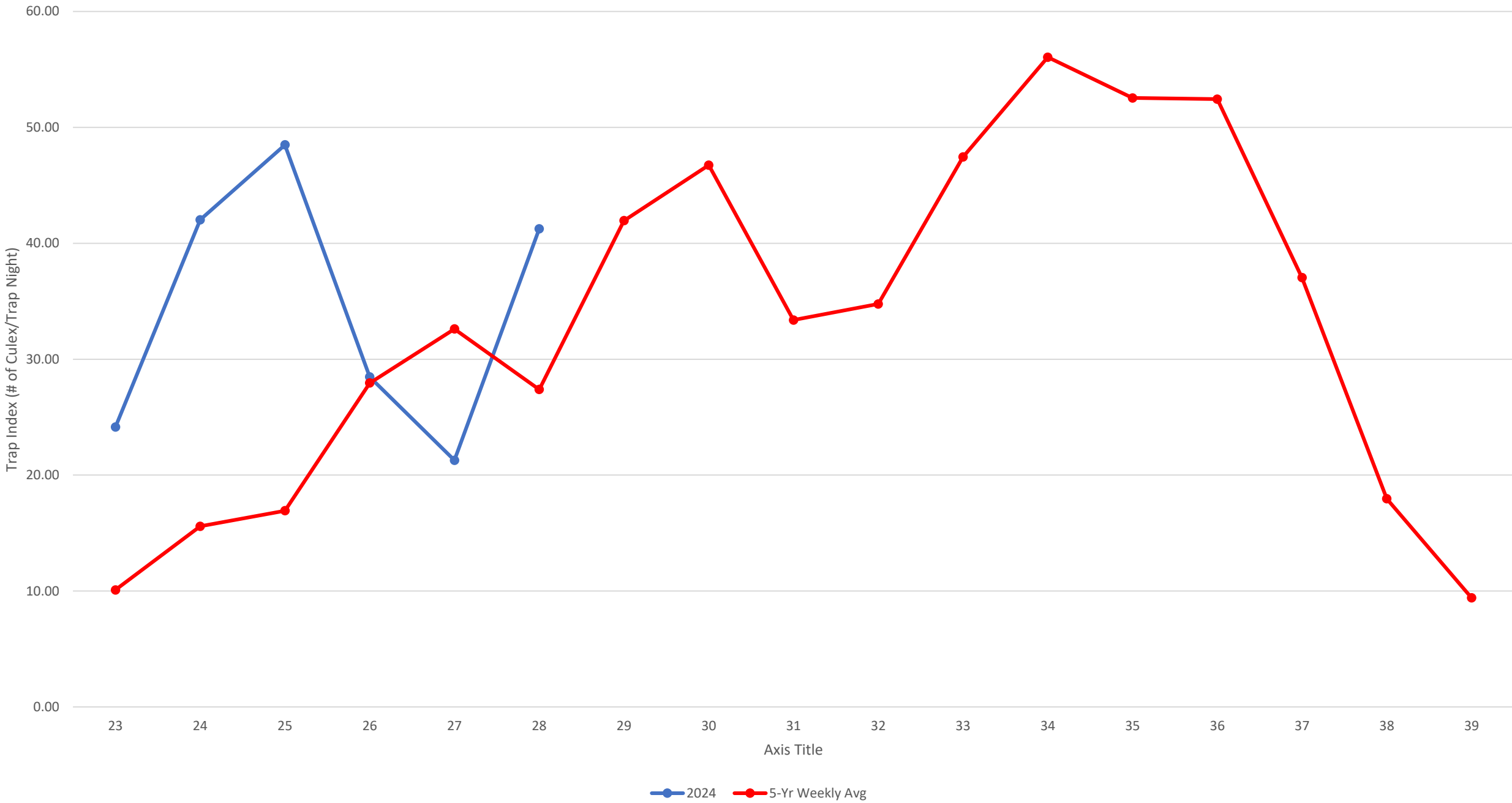


- Mosquito Surveillance
 - 56,290 total mosquitoes collected this season.
 - This is 99% more mosquitoes collected than in 2023 (n = 28,183) during the same time.
 - 15% (n = 8,696) of the collections have been *Culex* mosquitoes (primary WNV vector).
 - Biweekly (6/30/2024 – 7/13/2024) Statewide Total Mosquito Trap Index (mosquitoes/trap night).
 - **Above average** and 89% higher compared to 2023
 - **Increased** by 24% compared to week 27.
 - Biweekly (6/23/2024 – 7/6/2024) Statewide *Culex* Trap Index (*Culex*/trap night).
 - **Above average** and 8% higher compared to 2023.
 - **Increased** by 94% compared to week 27.
- Mosquito Testing
 - 8,562 *Culex* tested (in 479 pools) on the season.
 - 10 positive (2.1%) WNV positive pools detected.
 - No positive (0.0%) SLE or WEE positive pools detected.
 - Four vector surveillance regions have detected ≥ 1 positive WNV pool.
 - Biweekly (6/30/2024 – 7/13/2024) Statewide WNV Mosquito Infection Rate (MIR) Index
 - **High** (n = 2.33) WNV activity in submitted samples.

Total Mosquito Trap Index Nebraska Statewide, 2024



Culex Mosquito Trap Index Nebraska Statewide, 2024



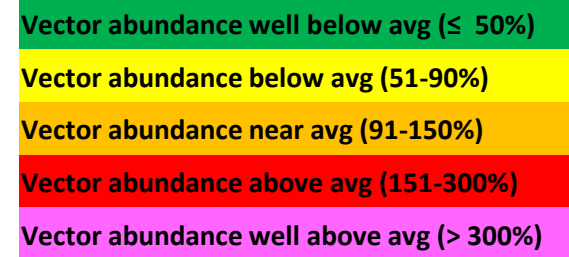
2024 Mosquito Abundance Results

Nebraska Total Mosquito Trap Indexes*

| Region | Wk 23 | Wk 24 | Wk 25 | Wk 26 | Wk 27 | Wk 28 | Wk 29 | Wk 30 | Wk 31 | Wk 32 | Wk 33 | Wk 34 | Wk 35 | Wk 36 | Wk 37 | Wk 38 | Wk 39 |
|-----------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Statewide | Red | Orange | Orange | Orange | Red | Red | | | | | | | | | | | |
| Southeast | Orange | Red | Yellow | Green | Orange | Orange | | | | | | | | | | | |
| Metro | Red | Orange | Orange | Red | Red | Pink | | | | | | | | | | | |
| North | Pink | Red | Green | Green | Pink | Pink | | | | | | | | | | | |
| Central | Red | Yellow | Yellow | Orange | Orange | Red | | | | | | | | | | | |
| West | Green | Red | Red | Red | Orange | Yellow | | | | | | | | | | | |

Nebraska *Culex* Mosquito Trap Indexes*

| Region | Wk 23 | Wk 24 | Wk 25 | Wk 26 | Wk 27 | Wk 28 | Wk 29 | Wk 30 | Wk 31 | Wk 32 | Wk 33 | Wk 34 | Wk 35 | Wk 36 | Wk 37 | Wk 38 | Wk 39 |
|-----------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Statewide | Red | Red | Red | Orange | Yellow | Red | | | | | | | | | | | |
| Southeast | Orange | Yellow | Orange | Orange | Yellow | Orange | | | | | | | | | | | |
| Metro | Pink | Pink | Pink | Yellow | Yellow | Pink | | | | | | | | | | | |
| North | Pink | Pink | Pink | Pink | Red | Pink | | | | | | | | | | | |
| Central | Red | Pink | Pink | Yellow | Green | Orange | | | | | | | | | | | |
| West | Red | Yellow | Green | Yellow | Yellow | Green | | | | | | | | | | | |



*Abundance levels are described in relative terms based on historical data from at most the previous 5 years.

West Nile Virus Mosquito Infection Rate

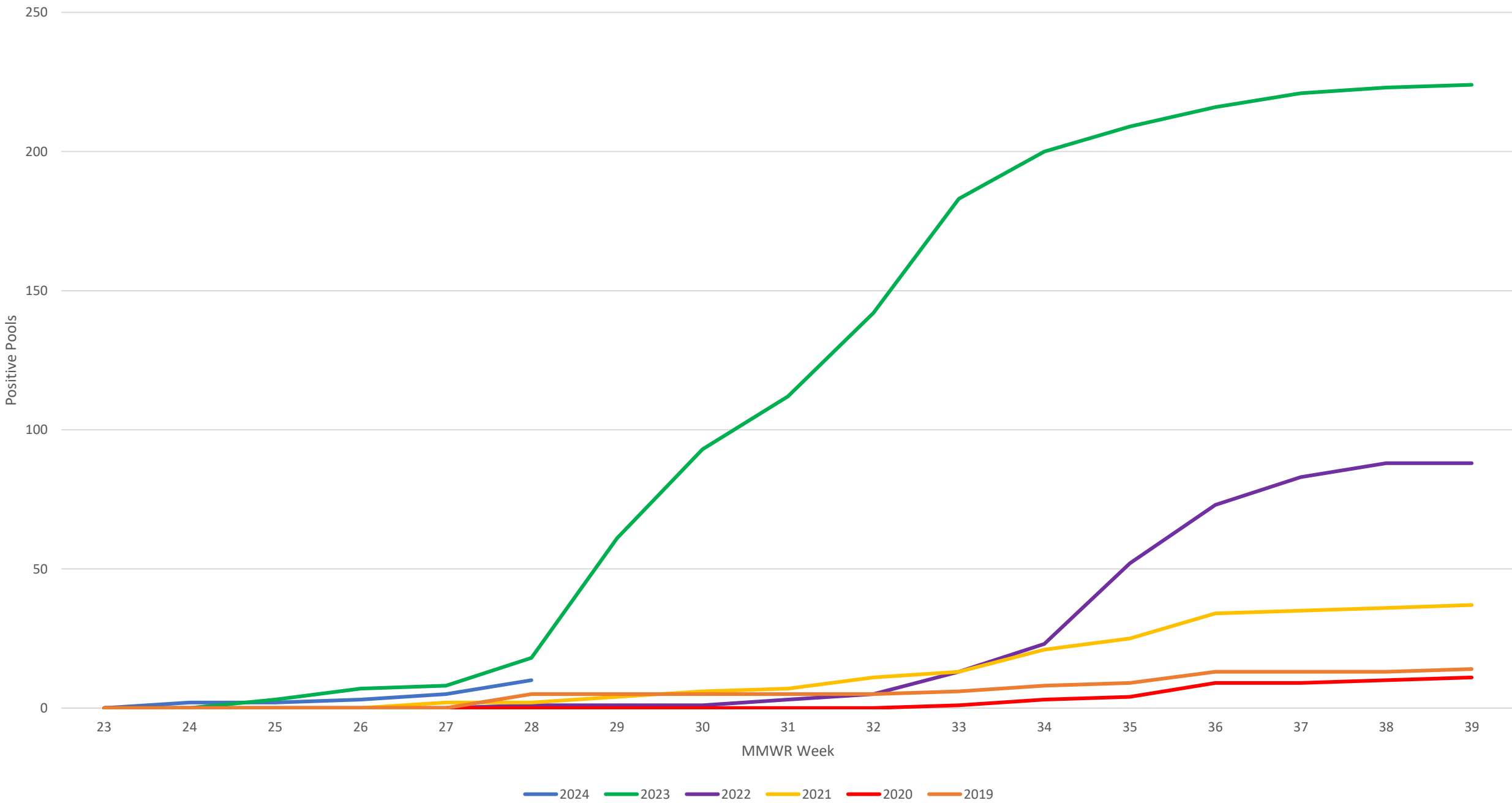
Nebraska *Culex* Mosquito Infection Rate (MIR)*

| Region | Wk 23 | Wk 24 | Wk 25 | Wk 26 | Wk 27 | Wk 28 | Wk 29 | Wk 30 | Wk 31 | Wk 32 | Wk 33 | Wk 34 | Wk 35 | Wk 36 | Wk 37 | Wk 38 | Wk 39 |
|-----------|-------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Statewide | Green | Yellow | Yellow | Yellow | Orange | Red | | | | | | | | | | | |
| Southeast | Green | Green | Green | Green | Green | Green | | | | | | | | | | | |
| Metro | Green | Orange | Orange | Green | Green | Orange | | | | | | | | | | | |
| North | Green | Green | Green | Green | Pink | Red | | | | | | | | | | | |
| Central | Green | Yellow | Yellow | Green | Green | Orange | | | | | | | | | | | |
| West | Green | Green | Green | Red | Orange | Pink | | | | | | | | | | | |



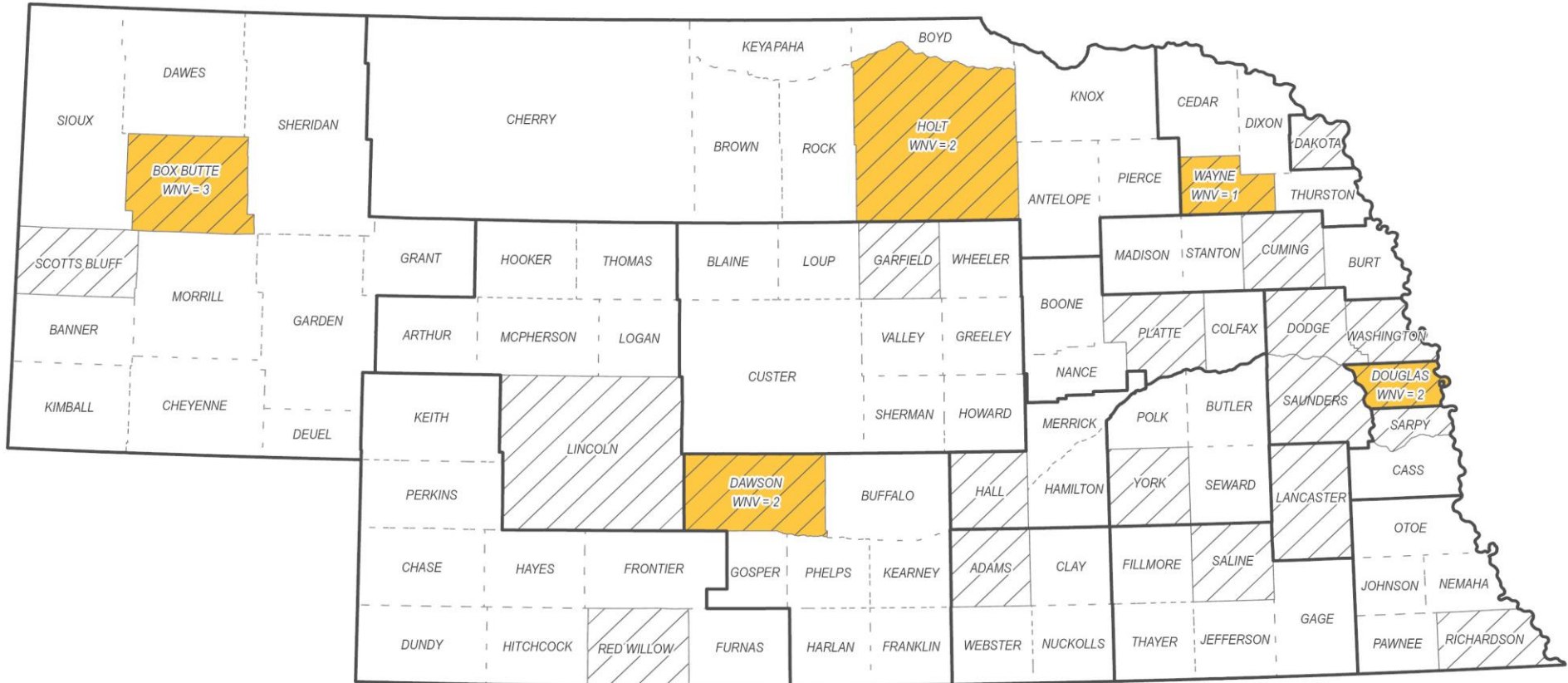
*MIR is the estimated infection rate of tested mosquito samples and is reported as the rate per 1,000 mosquitoes tested.

WNV Cumulative Positive Pools Nebraska Statewide, 2019-2024



2024 CDC Light Trap Mosquito Surveillance

Updated 17 July 2024



Total Pools Tested: 479

- Positive WNV Pool
- Counties with Traps
- Counties without Traps
- Local Health Department Boundary

West Nile Virus (WNV)
Positive Pools: 10
Counties with Positive Pools: 5

There are 22 counties with mosquito surveillance traps in 2024.



West Nile Virus Risk

- The WNV risk is calculated for each vector surveillance region (VSR). Risk assessments are calculated using the previous 2 weeks average temperature, *Culex* mosquito abundance, and WNV infection rates. Please note that risk calculations are used to get an estimate of WNV risk at a high-level view and may be different at more local levels.

| Risk | What it Means | What You Can Do |
|----------------------|---|--|
| None (Off Season) | 1. Infection with WNV is unlikely due to unfavorable mosquito conditions (e.g. late fall, winter, and early spring months) | Prepare for the upcoming mosquito season: 1. Eliminate objects and debris that hold water from your yard 2. Trim vegetation in your yard 3. Clean out gutters and repair torn or broken window and door screens |
| Low | 1. Below average risk of infection with WNV for the time of year | To Prepare: 1. Prepare for the upcoming mosquito season as above if not already done 2. Be aware of standing water in your yard and fill in low lying areas or treat with mosquito larvicide To Prevent: 1. Wear mosquito repellent when out between dusk and dawn 2. Wear long sleeves and long pants when out between dusk and dawn |
| Moderate | 1. Average risk of infection with WNV for the time of year 2. For Nebraska this means infection with WNV is likely or has already occurred | To Prevent – same as above plus: 1. Wear mosquito repellent 2. Wear long sleeves and long pants when possible 3. Dump standing water twice weekly |
| High | 1. Above average risk of infection with WNV for the time of year 2. More people may get infected with WNV in your area | To Prevent – same as above plus: 1. People over 50 or those who are immunocompromised should adjust outdoor activity to avoid peak mosquito hours (between dusk and dawn) where possible |
| Very High | 1. Unusually high risk for infection with WNV exists! | To Prevent – same as above plus: 1. People of all ages should adjust outdoor activity to avoid peak mosquito hours (between dusk and dawn) where possible |

West Nile Virus Risk

Nebraska WNV Relative Risk*

| Region | Wk 23 | Wk 24 | Wk 25 | Wk 26 | Wk 27 | Wk 28 | Wk 29 | Wk 30 | Wk 31 | Wk 32 | Wk 33 | Wk 34 | Wk 35 | Wk 36 | Wk 37 | Wk 38 | Wk 39 |
|-----------|----------|----------|----------|----------|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Statewide | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | None | None | None | None | None | None | None | None | None | None | None |
| Southeast | Low | Moderate | Moderate | Moderate | Low | Low | None | None | None | None | None | None | None | None | None | None | None |
| Metro | Moderate | High | High | Low | Low | Moderate | None | None | None | None | None | None | None | None | None | None | None |
| North | Moderate | Moderate | Moderate | Moderate | High | High | None | None | None | None | None | None | None | None | None | None | None |
| Central | Moderate | Moderate | Moderate | Low | Low | Moderate | None | None | None | None | None | None | None | None | None | None | None |
| West | Moderate | Low | Low | Moderate | Moderate | Moderate | None | None | None | None | None | None | None | None | None | None | None |

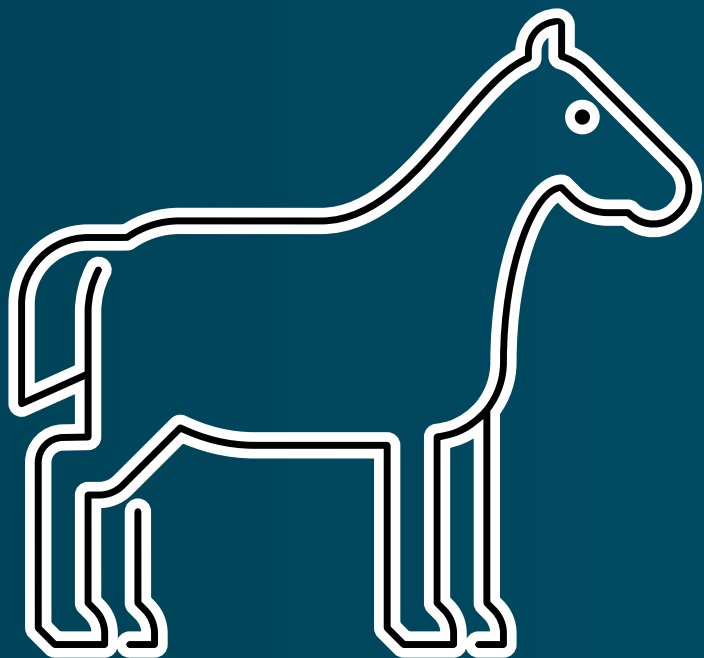


*WNV risk assessment is calculated using the previous 2 weeks average temperature data, Culex mosquito abundance data, and WNV mosquito infection rates.

Remember LOW risk does not equal NO risk.

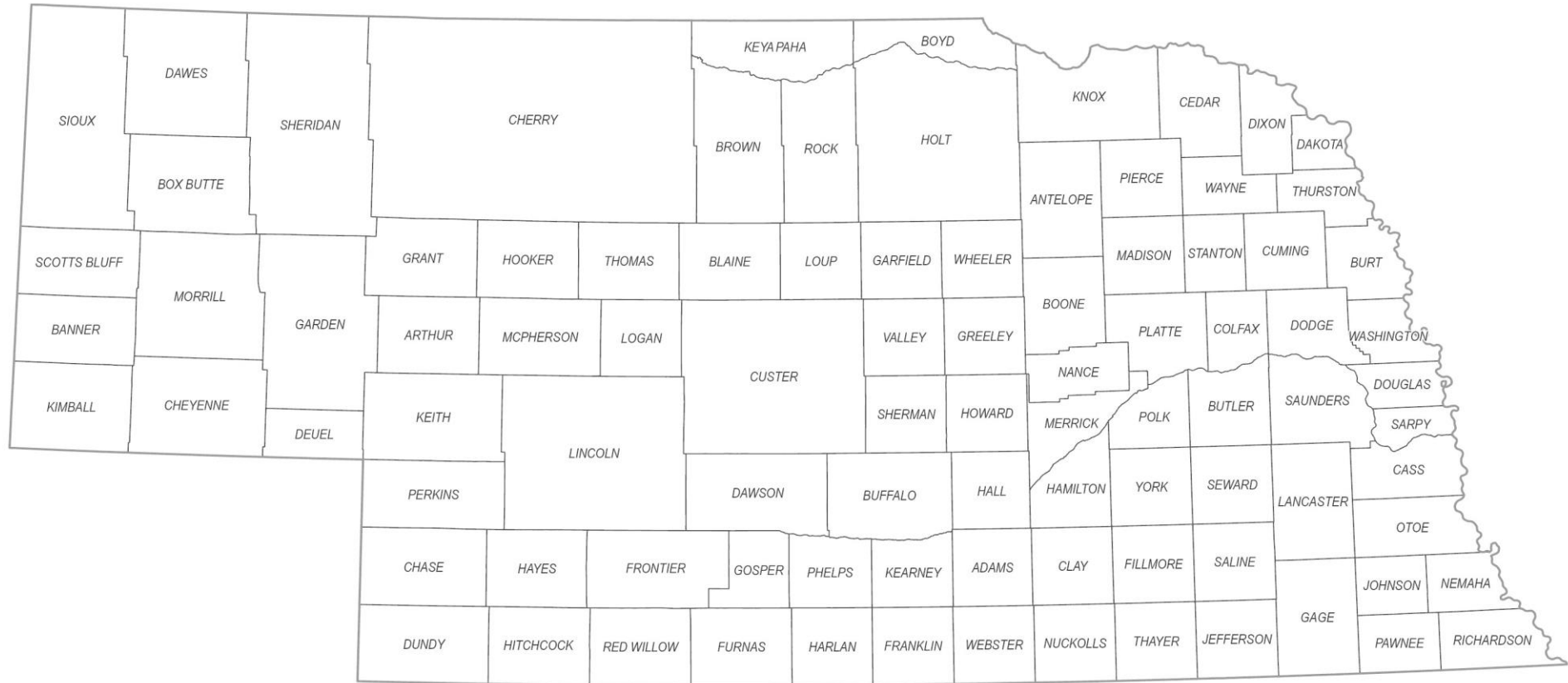


**BIRD AND EQUINE
WNV POSITIVE
REPORTS**



2024 Bird West Nile Virus Surveillance

Updated 17 July 2024



There have been no cases reported to date.

□ County Boundary



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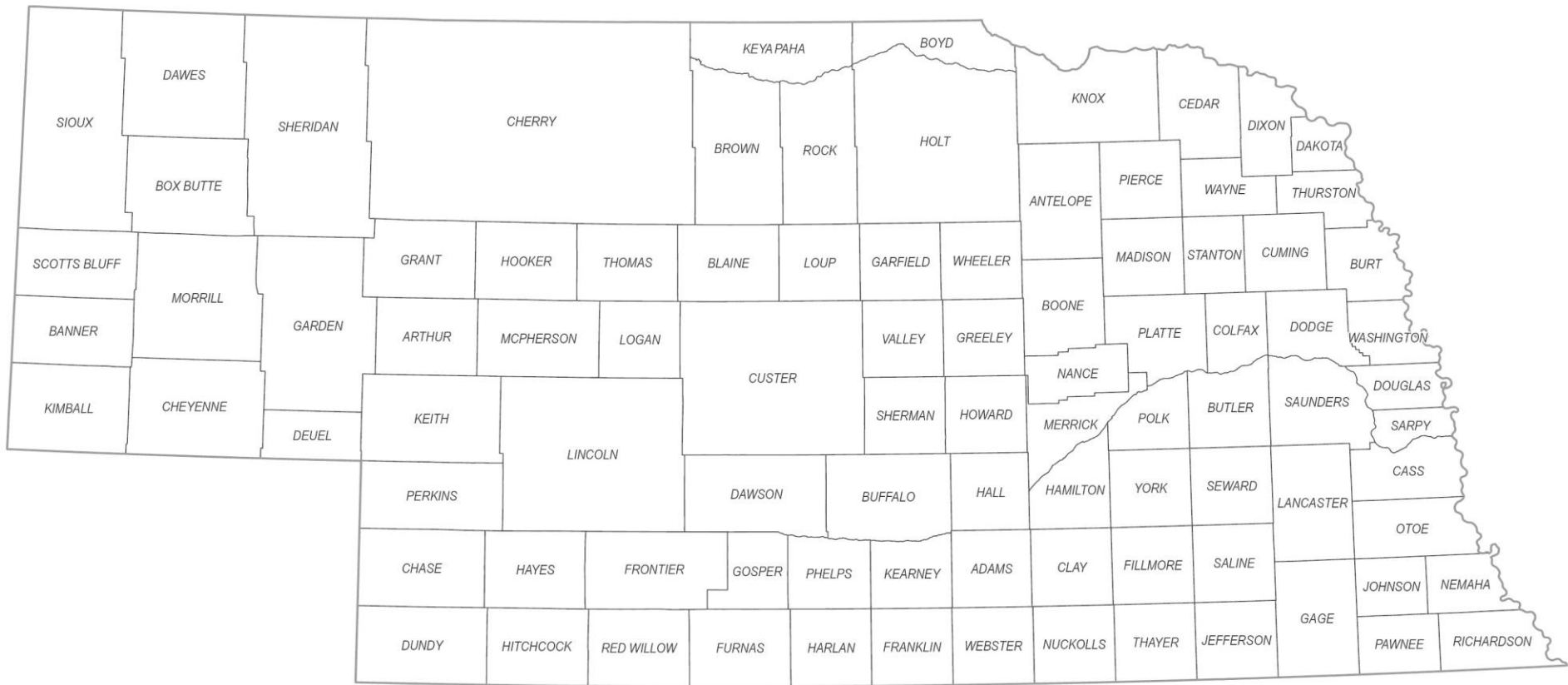
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2024 Equine West Nile Virus Surveillance

Updated 17 July 2024



There have been no cases reported to date.

County Boundary



2024 EPI WEEK CALENDAR

Months shown in **RED** are potential "Vector" months

JANUARY

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 1 | | 1 | 2 | 3 | 4 | 5 | 6 |
| 2 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 3 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 4 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 5 | 28 | 29 | 30 | 31 | | | |

FEBRUARY

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 5 | | | | | 1 | 2 | 3 |
| 6 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 7 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 8 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 9 | 25 | 26 | 27 | 28 | 29 | | |

MARCH

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 9 | | | | | | 1 | 2 |
| 10 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 11 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 12 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 13 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 14 | 31 | | | | | | |

APRIL

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 14 | | 1 | 2 | 3 | 4 | 5 | 6 |
| 15 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 16 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 17 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 18 | 28 | 29 | 30 | | | | |

MAY

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 18 | | | | 1 | 2 | 3 | 4 |
| 19 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 20 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 21 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 22 | 26 | 27 | 28 | 29 | 30 | 31 | |

JUNE

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 22 | | | | | | | 1 |
| 23 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 24 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 25 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 26 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 27 | 30 | | | | | | |

JULY

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 27 | | 1 | 2 | 3 | 4 | 5 | 6 |
| 28 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 29 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 30 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| 31 | 28 | 29 | 30 | 31 | | | |

AUGUST

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 31 | | | | | 1 | 2 | 3 |
| 32 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 33 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 34 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 35 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |

SEPTEMBER

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 36 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 38 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 39 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 40 | 29 | 30 | | | | | |

OCTOBER

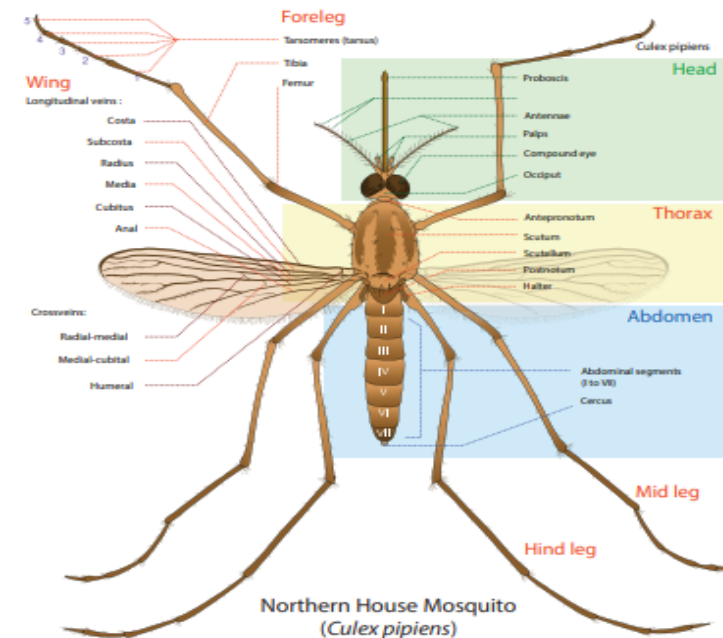
| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 40 | | | 1 | 2 | 3 | 4 | 5 |
| 41 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 42 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 43 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 44 | 27 | 28 | 29 | 30 | 31 | | |

NOVEMBER

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 44 | | | | | | 1 | 2 |
| 45 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 46 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 47 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 48 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |

DECEMBER

| EPI Week # | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|------------|-----|-----|-----|-----|-----|-----|-----|
| 49 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 50 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 51 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 52 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 1 | 29 | 30 | 31 | | | | |



Credit: Central Massachusetts Mosquito Control Project: <https://www.cmmcp.org/>

Resources

- CDC Prevent Mosquito Bites Page:
<https://www.cdc.gov/mosquitoes/prevention/index.html>
- CDC West Nile Virus Page:
<https://www.cdc.gov/west-nile-virus/index.html>
- Nebraska Department of Agriculture WNV Page:
<https://nda.nebraska.gov/animal/diseases/westnile/index.html>
- U.S. EPA Insect Repellent Page:
<https://www.epa.gov/insect-repellents>
- Nebraska Mosquito and Vector Control Association:
<https://www.nemosquito.org/>
- Nebraska Department of Health and Human Services Vector-Borne Disease Page:
<https://dhhs.ne.gov/Pages/Vector-borne-Disease.aspx>

